4.7 HYDROLOGY AND WATER QUALITY

The following describes the water resources of the project area and surrounding vicinity, including surface water and groundwater hydrology, drainage, water quality, and potential flooding conditions. Then, the regulatory setting involving water resources is described, potential impacts upon water resources by implementation of the project are analyzed, and mitigation measures to address potential impacts are identified.

4.7.1 SETTING

SURFACE WATER, DRAINAGE, AND FLOODING

The proposed project is located within the local watersheds of Pleasant Grove Creek and Auburn Ravine in western Placer County in the regional watershed of the Lower Sacramento River (USGS Cataloging Unit 18020109). The northern portion of the proposed road corridor drains from an unnamed tributary northward in to Orchard Creek, which flows west to the Auburn Ravine, then to a canal system into the Feather River, and finally the Sacramento River. The southern and western portion drains southwesterly from two unnamed tributaries into Pleasant Grove Creek, which flows west into a canal system into the Sacramento River. The major perennial and intermittent streams within the area are shown in the drainage map (**Figure 4.7-1**). Pleasant Grove Creek and its unnamed tributary receive surface flows from the southern portion of the proposed roadway alignment. The unnamed tributary is fed from drainage canals located to the northeast of the project site, which pass through the SIA, and by discharges from industries in the SIA including the Formica Plant. The tributary expands into a marshland area just west of the SIA. The proposed extension to Sunset Boulevard will bridge across the southern edge of the marsh area.

Orchard Creek and its unnamed tributaries receive surface flows from the northern section of the proposed roadway alignment. Orchard Creek was historically intermittent, with active flows confined to the wet weather season, which in this region ranges from an early onset of October to an extended decline in March. In response to the typical climatic pattern of wet winters/dry summers, most tributaries are intermittent. More recently, however, residential and golf course development upstream, and associated runoff from irrigation and water features, has caused the stream to flow year-round. There are no long-term continuous stream gauge records for Orchard Creek or its tributaries, although a series of gauges were operated intermittently between 1949 and 1966 on some of these streams (CH2M HILL, 1993). Most of the stream channels have been modified in the area (CH2M HILL, 1994). Extensive land leveling and channelization has reduced the flow capacity and volume of flood storage naturally available along the stream channels. Much of this channelization has resulted in smaller stream cross-sections and straighter alignments.

Figure 4.7-1 Drainage

The confluence of Orchard Creek and Auburn Ravine occurs in the westernmost portion of Placer County. This waterway continues westward crossing into Sutter County prior to joining the Cross Canal. Sutter County has been experiencing periods of flooding in this area during extreme wet weather events (South Lincoln Master Drainage Plan, 1998; personal communication, Doug Libby, Sutter County Community Services Department; personal communication, Garth Gaylord, City of Lincoln Community Development; CH2M Hill, 1994). The cause of flooding is attributed to several factors, including the following:

1) High flood stages of the Sacramento River cause a backup of flow at Cross Canal,
2) Increased flow upstream of Cross Canal cannot discharge in the elevated Sacramento River,
3) Manipulations of channel alignment in both Sutter and Placer Counties have altered the historical timing of peak flows during wet weather events,
4) A net increase in the conversion of open space to impervious surface has increased both peak flow and total discharge during wet weather events,
5) Improvements to the downstream hydrologic network have not kept pace with upstream development, and
6) Agricultural grading has flattened the landscape and diminished drainage potential.

Auburn Ravine, Orchard Creek, and Pleasant Grove Creek watersheds have extensive records of flooding. Damaging floods were recorded in December 1955, April 1958, December 1964, March 1983, February 1986, January 1995, and the most recent flood event in January 1997. The floods of 1986 and 1995 are the largest and most damaging on record, with calculated recurrence intervals of approximately 50 to 100 years. The Flood Insurance Rate Map prepared by the Federal Emergency Management Agency (FEMA) indicates that the proposed project site is not located within any 100-year floodplain (**Figure 4.7-2**).

Flooding occurs in some areas adjacent to the local creeks during periods of heavy rainfall. Localized flooding causes streams to overflow their banks, flooding property and structures located adjacent to channels. Flooding in the lower portions of the regional watershed is caused by the accumulation of floodwaters unable to efficiently drain to the Sacramento River through the Cross Canal and/or the Natomas East Main Drain. Flooding is also caused by downstream impediments in the floodplain, such as bridges, which cause the water to back up.

Insert figure 4.7-2 FEMA Flood zone

The 1998 *South Lincoln Master Drainage Report* analyzed the existing and future flood impacts on the City of Lincoln and surrounding areas from Auburn Ravine, Ingram Slough, and Orchard Creek resulting from an increase in stormwater runoff. The report identifies a primary study area and a secondary study area. The primary study area encompasses the proposed Del Webb, Twelve Bridges, and Lincoln Crossings developments in the Ingram Slough, Orchard Creek, and Auburn Ravine watersheds. The secondary study encompasses the entire Auburn Ravine watershed area and includes the proposed project site. Existing flood problems within the study area were identified and proposed mitigation measures were developed for improvements. The majority of these flood control measures would be constructed north of the project site near the City of Lincoln. Among the recommended improvements listed in the report, those affecting the proposed site include:

- The construction of a retention facility near the confluence of Ingram Slough and Orchard Creek. The facility would be sized to retain the estimated increase in runoff volumes in Ingram Slough and Orchard Creek caused by the changes in impervious surface areas in the proposed developments located south of Lincoln.
- A new channel would be excavated from the confluence of the Ingram Slough bypass channel, with the Ingram Slough North channel, to the confluence with Orchard Creek.
- A proposed roadway detention culvert at Tributary #3 of Orchard Creek, near State Route 65.

Development of the roadway would increase impervious surfaces, which could impact downstream drainage structures unless appropriate mitigation measures are incorporated. A drainage study and grading plan has been prepared (Martin & Martin, 2002). Sutter County Reclamation District 1001 has indicated that no significant increase in downstream flooding is anticipated if appropriate measures are implemented for the project (Personal communication, Don White, District Manager, March 24, 1999).

The culverts proposed for the project would drain localized low areas. There are no defined channels at these locations. Therefore, determining upstream impact at these locations is not practical to calculate, however to minimize possible impacts to areas upstream of the culvert, the culverts have been sized to pass the post-project 100-year flows without surcharging the culvert. Also, since upgradient areas are currently undeveloped, there would be no impact to structures.

Flow rates were calculated for the pre- and post-project conditions. Table 4.7-1 shows the area of pervious and impervious surface for the pre- and post-project conditions.

TABLE 4.7-1
AREA OF PERVIOUS AND IMPERVIOUS SURFACES

Sub-Basin	Pre-Roadway Condition		Post-Roadway Condition		Change	
	Pervious Surface (ac)*	Impervious Surface (%)	Pervious Surface (ac)*	Impervious Surface (%)	Pervious Surface (ac)*	Impervious Surface (%)
1A	34.6	0.0	33.6	2.9	1.0	2.9
1B	81.6	0.0	80.0	2.0	1.6	2.0
3	226.0	0.6	226.0	0.6	0.0	0.0
4	87.8	1.4	85.5	3.9	2.3	2.5
5	146.5	0.9	142.3	3.7	4.2	2.8
6	33.7	0.0	31.9	5.3	1.8	5.3
7	3.8	0.0	3.5	8.0	0.3	8.0
8	6.8	0.0	5.7	15.5	1.1	15.5
9	8.3	0.0	7.5	9.5	0.8	9.5
10	13.2	0.0	12.5	5.6	0.7	5.6
11	9.6	4.5	9.1	8.8	0.5	4.3

Source: Drainage Study– Thunder Valley Station Casino Off-site Improvements, Martin, Rivett & Olson, Inc, 2004, AES, 2004
*Note: Acres refers to the number of acres in the sub-basin.

The proposed project would add 14.3 acres of impervious surface to the drainage sub-basins affected by the proposed project and identified in the table above. The change in impervious surface was incorporated into the calculation of pre- and post- project flow rates. The post-project flow rates were not appreciably different than the pre-project conditions. Mapping for the grading plan is included in **Appendix K**. The drainage study discusses the peak flow conditions in more detail and shows the location of the sub-basins identified in the table above.

Land use largely affects surface water quality, with both point source and nonpoint-source discharges contributing contaminants to surface waters. The proposed project consists of a public road, and hence the water quality will be largely guided by the characteristics of road runoff. Storm water runoff from roadways contains a variety of characteristic contaminants. During storm events, rainwater first collects atmospheric pollutants and, upon surface impact, gathers roadway deposits. This runoff can be polluted, and negative impacts on receiving waters include sedimentation, eutrophication, and accumulation of pollutants in sediments and benthic organisms, and eradication of sensitive species. Pollutants found in roadway runoff are generally classified under the following six broad categories: suspended solids/particulates; oxygen-consuming constituents (e.g., BOD, COD); nutrients; heavy metals; trace organics; and microorganisms.

Typical concentrations of various constituents are presented in **Table 4.7-2**. Contaminants are deposited on paved areas and medians as a result of fuel combustion processes, lubrication system losses, tire and brake wear, transportation load losses, paint from infrastructure, and atmospheric fallout.

TABLE 4.7-2

TYPICAL STORM WATER RUNOFF QUALITY

Constituent	Unit	Average Storm Water Runoff Concentration from Highways*
Biological Oxygen Demand (BOD)	mg/L	15.5
Chemical Oxygen Demand (COD)	mg/L	86
pH (pH)	pH units	7.4
Temperature (Temp)	^{o}C	14
Total Dissolved Solids (TDS)	mg/L	118
Total Suspended Solids (TSS)	mg/L	160
Turbidity (Turb.)	NTU	60
Litter/trash (Trash)	lb/acre [(3)]	20.5
Toxicity (Tox.)	% Survival	Insufficient monitoring data
Oil and Grease (O&G)	mg/L	14.5
Metals (dissolved concentrations)		
Aluminum (Al)	ug/L	155
Arsenic (As)	ug/L	2.8
Cadmium (Cd)	ug/L	0.6
Chromium (Cr)	ug/L	3.1
Copper (Cu)	ug/L	15.8
Lead (Pb)	ug/L	7.3
Mercury (Hg)	ug/L	ND
Nickel (Ni)	ug/L	6.3
Selenium (Se)	ug/L	ND
Silver (Ag)	ug/L	0.6
Zinc (Zn)	ug/L	89.5
Nutrients		
Ammonia (NH_3)	mg/L	1.8
Nitrate (NO_3)	mg/L	1.6
Nitrite (NO_2)	mg/L	0.2
Ortho-phosphate (Ortho-P)	mg/L	0.2
Total Kjeldahl Nitrogen (TKN)	mg/L	2.9
Total Phosphorus (TP)	mg/L	0.3
Microbiological		
Fecal Coliform	MPN/100mL	8170
Total Coliform	MPN/100mL	30,500
Pesticide		
Chlorpyrifos	ug/L	0.6
Diazinon	ug/L	0.7
Glyphosate	ug/L	39.6

Source: CalTrans, 2001
*Average based on 1997-1998 and 1998-1999 monitoring data.

Sources of specific contaminants are outlined in **Table 4.7-3**. The impacts of roadway runoff are highly site-specific, and depend upon the timing, frequency, and intensity of storm events, local air quality, and level of traffic activity. Of particular concern is the runoff from "first flush" storm events, during which the first large storm of the season collects a relatively high concentration of contaminants. Also of concern is dry season runoff, which is also known to contain higher concentrations of contaminants.

TABLE 4.7-3

HIGHWAY RUNOFF CONSTITUENTS AND THEIR PRIMARY SOURCES

Constituent	Primary Source
Particulates	Pavement wear, vehicles, atmosphere, maintenance
Nitrogen, Phosphorus	Atmosphere, roadside fertilizer application
Lead	Auto exhaust, tire wear
Zinc	Tire wear, motor oil, grease
Iron	Auto body rust, steel highway structures, moving engine parts
Copper	Metal plating, bearing and bushing wear, moving engine parts, brake lining wear, fungicides and insecticides
Cadmium	Tire wear, insecticide application
Chromium	Metal plating, moving engine parts, brake lining wear
Nickel	Diesel fuel and gasoline (exhaust), lubricating oil, metal plating, bushing wear, brake lining wear, asphalt paving
Manganese	Moving engine parts
Sulphate	Roadway beds, fuel
Petroleum	Spills, leaks or blow-by of motor lubricants, antifreeze and hydraulic fluids, asphalt surface leachate
PCB's	Atmospheric deposition

Source: EPA, 1993; Corrales et al., 1996

GROUNDWATER

The project site is within the Placer and Yuba County Groundwater basin. The groundwater is recharged by rainwater that infiltrates through surface soils and stream and river bottoms. Much of the region is underlain by soils that limit the infiltration of groundwater and limit groundwater recharge (Michael Brandman Associates, 1992). The primary locations for potential groundwater recharge are along major watercourses. Groundwater in the general vicinity of the site was characterized by Applied Science and Engineering for the Stanford Ranch West Industrial Park project (Placer County, 1991a & b). Analysis of local groundwater well data and geologic data for the Stanford Ranch West project identified underlying groundwater conditions similar to those of the overall region. It was further concluded that the area's groundwater recharge rate was typically negligible as a consequence of surface geologic conditions and soils. Freshwater marshes in the vicinity were identified as a primary aquifer recharge source. Seasonal vertical seepage may be impeded by hardpan and silt or clay layers which can create some perched water zones (Espana, 2000). Groundwater was observed in exploratory borings at a depth of approximately 10-13 feet below ground surface at the proposed bridge site (Taber, 2001).

WATER SUPPLY

No municipal water is currently provided to the proposed site. An abandoned groundwater well is located along the proposed roadway alignment (**Figure 3.4-3**). This well will be capped as part of the Project. A nominal amount of water will be required for construction of the roadway, especially watering of roadbeds for gravel compaction and dust control. This water will be supplied by the Thunder Valley Casino domestic water supply. The completed project will not require a water supply. No landscaping requiring irrigation is planned to be installed for the Project.

REGULATORY SETTING

A variety of federal, state, and local agencies have jurisdiction over the project site. Important agencies and statutory authorities relevant to water quality as it relates to the Proposed Project are outlined below.

CLEAN WATER ACT

The Federal Water Pollution Control Act, as amended in 1972 (the "Clean Water Act," or "CWA," 33 USC 1251-1376), and as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." Important sections of the Act are as follows: Sections 303 and 304 provide for water quality standards, criteria, and guidelines Section 401 requires an applicant for any federal permit that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the state that the discharge will comply with other provisions of the Act.

PORTER-COLOGNE WATER QUALITY ACT

The State of California's Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) provides the basis for water quality regulation within California. The Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. Waste discharge requirements identified in the Report are implemented by the RWQCB.

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD AND REGIONAL BOARDS

The California State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout the state, while the nine Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and enforcement activities. The project area lies within the jurisdiction of the Central Valley RWQCB, which is responsible for the protection of beneficial uses of water resources within the Central Valley.

Beneficial uses are the desired resources, services, and qualities of the aquatic system that are supported by achieving and protecting high water quality. The Central Valley RWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and has adopted the Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins (RWQCB, 1998) to implement plans, policies, and provisions for water quality management. The Basin Plan was prepared in compliance with the CWA and the State Porter-Cologne Water Quality Control Act. The Basin Plan establishes beneficial uses for major surface waters and their tributaries, water quality objectives that are intended to protect the beneficial uses of the Basin, and implementation programs to meet stated objectives and to protect the beneficial uses of water in the Basin. Beneficial uses for groundwater in the region as designated by the RWQCB include municipal, agricultural, and industrial uses. Water quality objectives listed for groundwater include thresholds for bacteria, organic and inorganic chemical constituents, radioactivity, taste and odor, and toxicity. Beneficial uses for surface waters of the region have been assigned MUN designations; in addition, beneficial uses have been designated for the South Fork of the American River, into which waters from the project site ultimately drain. Beneficial uses of identified waters generally apply to their tributary streams. These uses include municipal, agricultural, industrial, and recreational uses, freshwater habitat, and wildlife habitat. Water quality objectives for surface waters have been set concerning bacteria, bioaccumulation, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, radioactivity, population and community ecology, pH, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, turbidity, and ammonia. Objectives for specific chemical constituents are regulated dependent upon the beneficial use of the water body. Specific water quality objectives and standards for both surface and groundwater supplies are outlined in the Basin Plan (RWQCB, 1998).

NPDES PROGRAM AND CONSTRUCTION ACTIVITY PERMITTING

As authorized by the CWA, the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Section 402 of the CWA specifically required EPA to develop and implement the NPDES program. The CWA gives EPA the authority to set effluent limits on an industry-wide (technology-based) basis and on a water-quality basis to ensure protection of receiving waters. The CWA requires anyone who wants to discharge pollutants to first obtain an NPDES permit, or else that discharge will be considered illegal. The CWA allowed EPA to authorize the NPDES Permit Program to state governments, enabling states to perform many of the permitting, administrative, and enforcement aspects of the NPDES Program. In states that have been authorized to implement CWA programs (including California), EPA still retains oversight responsibilities (USEPA, 2003).

While federal regulations allow two permitting options for storm water discharges (individual permits and General Permits), the SWRCB has elected to adopt only one statewide General Permit at this time that will apply to all storm water discharges associated with construction activity.

Construction activity subject to this General Permit includes clearing, grading, disturbances to the ground such as stockpiling, or excavation that results in soil disturbances of at least one acre of total land area. Construction activity that results in soil disturbances of less than one acre is subject to this General Permit if the construction activity is part of a larger common plan of development that encompasses one or more acres of soil disturbance or if there is significant water quality impairment resulting from the activity. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility, nor does it include emergency construction activities required to protect public health and safety. A construction project which includes a dredge and/or fill discharge to any jurisdictional surface water (e.g., wetland, channel, pond, or marine water) will also need a CWA Section 404 permit from the U.S. Army Corps of Engineers and a CWA Section 401 Water Quality Certification from the RWQCB/SWRCB.

Discharges of stormwater associated with construction that results in the disturbance of one acre or more of land must apply for coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Construction General Permit). Storm Water Pollution Prevention Plan (SWPPP) documents are required as a condition for coverage under the Construction General Permit. The SWPPP is intended to assist in preventing sediment and non-visible pollutants from contaminating storm water discharges from the construction site. The SWPPP is considered a report that shall be available to the public by the RWQCB under Section 308(b) of the Clean Water Act. It is not required that the SWPPP be submitted to the RWQCB unless specifically requested. Dischargers shall submit a Notice of Intent (NOI) to obtain coverage under this General Permit. The signing and submission of the NOI form obligates the operator to comply with the terms of the Construction General Permit (including implementation of the SWPPP). After completion of construction activities and final stabilization of the site, an operator must complete and submit a Notice of Termination (NOT) Form to the RWQCB.

This General Permit requires all dischargers where construction activity disturbs one acre or more, to:

1. Develop and implement a SWPPP which specifies Best Management Practices (BMPs) that will prevent all construction pollutants from contacting storm water and with the intent of keeping all products of erosion from moving off site into receiving waters;
2. Eliminate or reduce non-storm water discharges to storm sewer systems and other waters of the nation; and
3. Perform inspections of all BMPs.

4.7.2 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

A water quality impact directly or indirectly resulting from the Proposed Project would be considered significant if it would:

- Violate any water quality standards, waste discharge requirements, or otherwise substantially degrade water quality;
- Substantially alter the existing drainage pattern of the site or area, which would result in substantial erosion or siltation on or off site; or
- Create or contribute runoff water, which would provide substantial additional sources of polluted runoff to existing or planned stormwater drainage systems.

Drainage impacts for this project will be considered significant if the additional flows for predetermined storm events exceed the design capacities of existing structures (four culverts and one bridge downstream of the Proposed Project) or cause surface erosion above background levels defined by the NRCS universal soil loss equations. For stream culverts this would mean the exceedance of the allowable headwater and/or causing excessive erosion of the culvert embankments. As it applies to the design capacity of bridges, the additional discharge must not exceed the expected peak flow surface elevation of waters during a one hundred (100) year event or significantly contribute to an existing exceedance. This limit is one (1) foot below the bottom elevation of the bridge. As with culverts, erosion must not be accelerated at the bridge abutments.

The project components are expected to maintain adherence to the relevant policies and goals of the *Sunset Industrial Area Plan,* Placer County Flood Ordinances, and the *Placer County Storm Water Management Manual.*

A hydrologic, flooding, or water quality impact of the proposed project would be considered significant if it met any of the following criteria:

- Generates substantial storm water runoff.
- Contaminates a public water supply.
- Substantially degrades water quality.
- Substantially degrades or depletes groundwater resources.
- Causes substantial flooding, erosion, or siltation
- Exposes people or structures to flood hazards.

Comments received on the Notice of Preparation pertaining to hydrology concerns are addressed in the section below. Appendix A includes the Notice of Preparation and comment letters received as a result.

IMPACT/ MITIGATION

Impact

4.7.1 Surface waters may become degraded as a result of runoff from the project area. Construction and operations may contribute pollutants to nearby creeks and their tributaries during storm events and/or normal operations. This would be a significant impact.

Construction of the project would involve soil-disturbing activities such as vegetation removal, grading, and excavation that may result in soil erosion and sediment discharge into surface waters, increased turbidity, and downstream sediment deposition. Temporary stockpiling of excavated soils would have the same effect if subject to erosion during rainfall. In addition, fuels, solvents, and other chemicals used in construction activities could be accidentally spilled, dumped, or discarded and ultimately leak into receiving bodies of waters.

Mitigation Measures

4.7.1a Prior to construction, the contractor shall comply with the conditions of the General Stormwater National Pollutant Discharge Elimination System (NPDES) Permit for Construction Project from the California State Water Resources Control Board (SWRCB). The permit requires a Storm Water Pollution Prevention Plan that addresses water quality impacts associated with construction.

A Notice of Intent was filed by UAIC/Stations Casino in April 2003. UAIC was issued an ID No. 5S31S320892 for the NPDES Permit for General Construction Activities No. CAS000002, Order No. 99008-DWQ by the RWQCB for this project. The project shall conform to the requirements of this General Construction Permit, and specifically, the project shall conform to the requirements in the approved storm water pollution prevention plan (UAIC, 2003) designed for this project:

- United Auburn Indian Community Storm Water Pollution Prevention Plan for Phase II Offsite Improvements Sunset Boulevard and Foothills Boulevard. Auburn Rancheria Gaming and Entertainment Facility Project. 2003. Prepared by Analytical Environmental Services, Sacramento, California.

The conditions to protect water quality outlined in the NPDES permits, the SWPPP, and any additional RWQCB requirements would be implemented to mitigate impacts on water resources to a less-than significant level.

BMP's that may be identified in the SWPPP include, but are not limited to, the following:

- Existing vegetation will be retained where possible. To the extent feasible, grading activities will be limited to the immediate area required for construction.

- Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) will be employed for disturbed areas and stockpiled soil.

- No disturbed surfaces will be left without erosion control measures in place during the winter and spring months. Construction activities will be limited to the non-rainy season (May-October).

- Sediment will be retained onsite by a system of sediment basins, swales, or other appropriate measures.

- A spill prevention and countermeasure plan will be developed which will identify proper storage, collection, and disposal measures for potential pollutants (such as fuel storage tanks) used onsite, as well as the proper procedures for cleaning up and reporting of any spills.

- Potentially hazardous materials will be stored away from drainages, and containment berms will be constructed to prevent spilled materials from reaching water bodies.

- Vehicles and equipment used during construction will be provided proper and timely maintenance to reduce potential for mechanical breakdowns leading to a spill of materials into water bodies. Maintenance and fueling will be conducted in an area that meets the criteria set forth in the spill prevention plan.

- Disturbed areas will be revegetated after completion of construction activities.

- Water quality control measures identified in the Storm Water Pollution Prevention Plan shall include, but are not limited to, the following:

    - Existing vegetation will be retained where possible. To the extent feasible, grading activities will be limited to the immediate area required for construction.

    - Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) will be employed for disturbed areas.

    - No inactive disturbed surfaces will be left without erosion control measures in place during the winter and spring months.

    - Sediment will be retained onsite by a system of sediment basins, traps, or other appropriate measures.

    - A spill prevention and countermeasure plan will be developed, if necessary, which will identify proper storage, collection, and disposal measures for potential pollutants (such as fuel storage tanks) used onsite.

    - Grading activities shall not impact vernal pools unless otherwise approved as part of the project.

The project shall incorporate permanent features designed to minimize impacts on water quality. They shall include:

- Permanent energy dissipaters will be included for storm drain outlets.

4.7.1b Implement Mitigation Measure 4.6.1b, which states that all proposed grading, drainage improvements, and vegetation removal shall be shown on the Improvement Plans and all work shall conform to provisions of the County Grading Ordinance that are in effect at the time of submittal.

4.7.1c Implement Mitigation Measure 4.6.1c, which states that in order to protect site resources, no grading activities of any kind may take place within the 100-year flood plain of the stream nor within the watershed of the vernal pool(s), unless otherwise approved as a part of this project.

Significance After Mitigation

Less than significant.

Impact

4.7.2 Development of the site would increase runoff as a result of the introduction of impervious surfaces, which could increase erosion and/or contribute to flooding downstream. The hydrology could be altered by increasing both peak flow and total runoff during wet weather events. This could be a significant impact.

The SIA Plan EIR identified increased runoff as a cumulatively significant impact of development of the Sunset Industrial Area. An analysis was conducted for the proposed project, as described below, to determine its contribution to this cumulative impact. Specifically, a drainage study/plan has been prepared in accordance with the Placer County Flood Control and Water Conservation District's Stormwater Management Manual. The Placer County Stormwater Management Manual is the controlling document as established by the lead agency overseeing flood controls and stormwater management in the region. All storm drainage planning shall adhere to the criteria presented in the Placer County Stormwater Management Manual.

The Placer County Stormwater Management Manual states on Page II-2 in Chapter II, Section C-1.a, "*Storm drainage planning and design in Western Placer County shall adhere to the criteria presented in this manual. Governmental agencies and engineers shall utilize the manual in the planning of new facilities and in their reviews of proposed works by developers, private parties, and other governmental agencies*".

The Placer County Stormwater Management Manual further states in Chapter II, Section 5-a, "*Natural drainageways shall be used for stormwater runoff whenever possible*." The project design will ultimately discharge all runoff to a tributary of Orchard Creek after detention.
Chapter II, Sections 7-a states, "*Master Plans will be prepared as soon as possible for each drainage basin*." The relevant Master Plan to this development is the South Lincoln Master Drainage Plan: Auburn Ravine, Ingram Slough and Orchard Creek (1998). In Chapter V, Section H, the Placer County Stormwater Management Manual states: *"The upstream property owner may reasonably increase drainage runoff by paving or construction of other impervious surfaces, including buildings without liability."*

The South Lincoln Master Drainage Plan states:

> *" ...that 'reasonable' increases in runoff due to development are allowable. Due to the extreme flooding problems that occur downstream as a result of total storm runoff, the City of Lincoln has agreed to mitigate the increases in volume and peak flow through the use of retention and detention facilities. As mitigation for the increases in runoff volumes from the developing areas, a retention basin, or long-term detention facility could be constructed within the Auburn Ravine, Ingram Slough, and Orchard Creek watershed, east of the Sutter County/Placer County line. The basin would divert flows from the existing drainage paths, once certain levels of flow are exceeded. The diverted runoff would be stored throughout the remainder of the storm event. If any releases would be permitted, they would occur once the downstream flooding has subsided."*

Sutter County Reclamation District 1001 has indicated that no significant increase in downstream flooding is anticipated if appropriate measures are implemented for the project (Personal communication, Don White, District Manager, March 24, 1999).

In regard to the potential for erosion, there is little opportunity for on-site erosion, as the majority of the proposed project will be covered with impervious surfaces and on-site gradients are quite flat.

The report, "Drainage Study – Thunder Valley Station Casino Off-site Improvements" was prepared in 2002 and revised in June 2004 by a Registered Civil Engineer at Martin Rivett Olson Engineers (**Appendix F**). The report includes the following:

- A written text addressing existing conditions;
- Effects of proposed improvements;
- All appropriate calculations;
- A watershed map;
- Identification of increases in downstream flows;
- Description of proposed on- and off-site improvement and drainage easements to accommodate increased flows;
- Description of best management practices during construction phases;
- Description of best management practices installed as project components designed to reduce erosion, water quality degradation, etc.

The drainage improvements proposed as a part of the project meet the minimum design standards of the Placer County Storm Water Management Manual for existing and future conditions. No adverse impact is anticipated to both upstream and downstream storm drain systems if constructed as shown. The proposed road culverts are adequate to convey 10 and 100-year peak flows. The storm drain system in Athens Avenue and Foothills Boulevard was designed to convey the 100-year peak flows without encroaching into the travel lanes.

The proposed project shall be graded as detailed in the Drainage Study. The storm drain improvements recommended in the Drainage Study shall be constructed as detailed. The report shall be submitted for review and approval prior to construction activities.

Mitigation Measures

None required.